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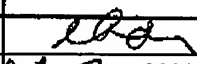
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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>	Application Number	10/706,162	
	Filing Date	11/12/2003	
	First Named Inventor	Farid Nemati	
	Art Unit	2815	
	Examiner Name	Jerome Jackson Jr.	
Total Number of Pages in This Submission	5	Attorney Docket Number	C-028

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Applicant:	Nemati, et al.	Examiner:	Jerome Jackson Jr.
Serial No.:	10/706,162	Group Art Unit:	2815
Filed:	Nov. 12, 2003	Docket No.:	C-028
Title:	THYRISTOR CIRCUIT AND APPROACH FOR TEMPERATURE STABILITY		

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a reply to the Examiner's Answer mailed Aug. 3, 2006. Upon a review of the Answer, it appears that there are differences between applicants and the Examiner in the interpretation of the claims and prior art. The following is a discussion of these differences in order to clarify the issues for consideration by the Board.

- (1) Whether the NMOSFET of Nemati in Fig. 8 teaches the "second signal" in the last claim element of claims 1, 6 and 19**

The last claim element of claim 1 recites: "a second control port configured and arranged for receiving a second signal generated outside of the thyristor and for coupling the second signal at least to the second base region, the second signal being adapted to control holding current or forward blocking voltage of the thyristor as a function of temperature" (emphasis added). Claims 6 and 19 have similar claim language. The fifth line of the last paragraph of page 6 of the Examiner's Answer discusses figure 8 of Nemati, and states: "The gate signal is thus "coupled" to the n Base 814 through the source/drain contact as shown in the figure." The Examiner states that "Appellant is apparently reading too much into the claim language and apparently arguing that the claim requires a direct capacitance control port connection."

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Reply Brief

Appellant does not argue that the claim requires a direct capacitance control port connection. Appellant argues that the language of the claim requires (1) the second signal should be generated outside of the thyristor, and (2) the second signal should be coupled to at least the second base region. Appellant contends that figure 8 of Nemati does not teach these limitations, as explained below. On the other hand, the Examiner appears to believe that figure 8 teaches these limitations.

The Examiner appears to identify the "gate signal" of Nemati with the claimed "second signal." However the gate signal in Nemati is used to control the resistance between the source and drain of the NMOSFET (see col. 7, lines 17-35 of Nemati, which has been copied on page 5 of the Appeal Brief mailed Oct. 18, 2005). If the resistance is low, the NMOSFET provides a strong shunt between the anode and n-base of the thyristor; if the resistance is high, the NMOSFET provides a weak shunt. **Thus Nemati teaches that the gate signal is used only by the NMOSFET to affect its resistance, and it is not used by or coupled to the thyristor.** Thus, the gate signal is not coupled to the n Base 814 of the thyristor, as contended by the Examiner. Further, appellant's argument does not require a direct capacitance control port connection.

(2) **Discussion of figure 5a of Nemati**

Figure 5a of Nemati was used as a basis of rejection in the Non-Final Office Action mailed Dec. 10, 2004. In the response to that Office Action submitted March 4, 2005, figure 5a was discussed on pages 7 and 8. In the Final Office Action mailed May 26, 2005, the Examiner did not mention figure 5a again. As a result, this figure was not discussed in the Appeal Brief. Because this issue is raised again in Examiner's Answer, Appellant now discusses the rejection based on Fig. 5a of Nemati.

Nemati describes Fig. 5a as follows (col. 6, lines 31-45; emphasis added):

"FIG. 5a shows another example embodiment of the present invention, wherein a tunnel node 542 and tunnel dielectric 544 are formed over the base 514 of an anode end portion 510 of a capacitively coupled thyristor 500. The tunnel node is resistively coupled to the base 514 via a tunneling current through the tunnel

dielectric, which is sufficiently small in thickness (in one example implementation, about 30 angstroms) to permit leakage current from the base to the tunnel node. As with other examples described hereinabove, the thyristor includes gate 530 capacitively coupled to a base region 524 of a cathode end portion 520 of the thyristor, which also includes emitter region 522 and, at the anode end portion 510, an emitter region 512."

It can be seen from the above quoted paragraph that the function of the tunnel node is to permit leakage current from the base to the tunnel node. The leakage current is generated by the thyristor. For example, Fig. 4a of Nemati does not have an external element similar to tunnel node 542 of Fig. 5a, yet this thyristor generates leakage current (see the below description of Fig. 4a).

"FIG. 4a shows one example implementation of such a tunnel junction, wherein a heavily doped n+ tunnel junction 440 acts as a tunnel diode and is formed between an n base region 414 and a p+ emitter region 412 of an anode end portion 410 of a thyristor 400. A gate 430 is coupled via a gate dielectric 432 to the p base 424 of a cathode end portion 420 of the thyristor, which also includes n+ emitter region 422. The tunnel diode effects a leakage current that enhances thyristor stability while keeping the thyristor holding current acceptably low." (col. 6, lines 13-22; emphasis added).

Because leakage current is generated by a thyristor, the leakage current in Fig. 5a is not an external signal coupled to the thyristor. On the other hand, claims 1, 6 and 19 recite that the control port couples to a base region a signal generated outside of the thyristor. Thus, there are significant differences between Fig. 5a and the claim invention.

(3) Whether the words "as a function of" is language of intended use and the structure of Nemati can function in the manner claimed

The last claim element of claim 1 recites: "a second control port configured and arranged for receiving a second signal generated outside of the thyristor and for coupling the second signal at least to the second base region, the second signal being adapted to control holding current or forward blocking voltage of the thyristor as a function of temperature." Claim 19 has similar language. It appears that the Examiner contends that the term "as a function of" is language of "intended use" (see page 3 of the Non-final Office Action mailed Dec. 10, 2005 and also

Examiner's Answer). The term "as a function of" in claim 1 is typically used in engineering and scientific literature indicating dependency of one variable on another variable. In claim 1, the controlling variable is temperature. This is positive recitation of a limitation and is not language for intended use. As explained on page 6, section (8)(A)(2), of the previously filed Appeal Brief, Nemati does not teach or suggest this limitation.

The last claim element of claim 6 recites: "a second circuit including a second control port configured and arranged for receiving a second signal generated outside of the thyristor and for coupling the second signal at least to the second base region as a function of the detected failure for controlling holding current or forward blocking voltage of the thyristor." Nemati does not teach or suggest any dependency on "detected failure," let alone the specific dependency recited in claim 6. Thus Nemati does not teach or suggest this limitation.

In conclusion, the language in claims 1, 6 and 19 are not "intended use" language, and the structures in Nemati do not contain the claimed limitations.

Conclusion

Appellant believes that there is more than one limitation in all the independent claims that are not taught or rendered obvious by Nemati. Consequently, the claims are patentable over Nemati.

The commissioner is hereby authorized to charge any fees which may be required for this paper to deposit account 50-2538.

Oct. 2, 2006

Respectfully Submitted



H. C. Chan
Reg. No. 35, 477